# PROTOCOL FOR ISSUING HEALTH ADVISORIES AND BANS BASED ON CHEMICAL CONTAMINATION OF FISH/SHELLFISH IN LOUISIANA


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**January 1997**

STATE OF LOUISIANA
DEPARTMENT OF HEALTH AND HOSPITALS

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# INTERAGENCY AGREEMENT BETWEEN LOUISIANA DEPARTMENT OF HEALTH AND HOSPITALS, LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY, LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES AND LOUISIANA DEPARTMENT OF AGRICULTURE AND FORESTRY

The Louisiana Department of Health and Hospitals, Office of Public Health hereinafter referred to as "LDHH/OPH", the Louisiana Department of Environmental Quality, hereinafter referred to as "LDEQ", the Louisiana Department of Wildlife and Fisheries, hereinafter referred to as "LDWF" and the Louisiana Department of Agriculture and Forestry, hereinafter referred to as "LDAF" agree to work together to protect Louisiana citizens' health by following the procedures described in the document entitled Protocol for Issuing Health Advisories and Bans Based on Chemical Contamination of Fish/Shellfish in Louisiana, dated January 1997.

This working agreement will not involve the exchange of funds but will be limited to exchange of services as necessary, including, but not limited to appropriate personnel for consultation, investigations and determining appropriate actions in cases where fish contamination poses a threat or potential threat to human health. Each agency shall designate one or more persons of their personnel as points of contact to assure expeditious performance of this working agreement.

This understanding shall be effective upon execution and shall not be canceled by any agency unless thirty days notice is given to the other agencies.

So agreed this 22 day of Jan, 1997.

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## 1.0 INTRODUCTION

Sportsmen of all ages enjoy the recreational aspects of fishing and shellfishing in Louisiana. Large commercial harvests of fish and shellfish from the state are shipped nationwide. In order to safeguard and protect public health, advisories may be issued in Louisiana from time to time, and have been since the early 1980s. The purpose of these guidelines is to reduce or eliminate possible adverse health impacts of toxic substances present in some fish or shellfish.

Health advisories state which activities or fish consumption levels pose a health risk to the public and attempt to advise the public regarding fish and shellfish consumption and recreational water activities that may adversely affect public health. In addition, bans which prohibit harvesting or sale of fish and/or seafood in order to protect the public's health may also be issued. Currently, there are no bans effective in Louisiana related to chemical contamination. This document describes the steps involved in issuing health advisories and harvest bans resulting from chemical contamination of Louisiana water or fish/shellfish.

Many types of information must be used to arrive at an acceptable risk management decision for each species or geographical area being evaluated. Information about completed exposure pathway(s), local population practices and customs and biomarkers of exposure are examined. Additional information regarding exposure may be obtained from creel surveys (what fish species are actually caught), and fish consumption surveys (what fish are eaten). This information is incorporated into the exposure analysis when it is available. If exposure is possible, the estimated dose is evaluated in comparison to appropriate health outcome data. Factors making certain subpopulations more susceptible, such as local practices and customs, are also included, when necessary.

In the development of a health advisory, a risk assessment is incorporated into a risk management decision to best protect public health from the potential threats of chemically contaminated biota. Both cancer and non-cancer risks are used to determine a course of action in areas where contamination is identified. A risk management plan is developed from the risk assessment as well as economic and political considerations and is always protective of public health. Throughout this process the public should be reassured that fish are a low-fat, high-protein, staple food source and there are many health benefits from including them in one's diet.

### 1.1 Definition of Sport and Commercial Fishing

Fishing activity falls into one of two categories, sport or commercial. Sport fish are consumed by the family and friends of the angler. In contrast, commercial fishing involves the sale of the catch. Any person who takes living aquatic resources for commercial purposes is considered a commercial fisherman. Both forms of fishing require a license. A commercial fishing license is required by law to sell fish and a recreational fishing license is required to fish recreationally.

Both forms of fishing in Louisiana are regulated by the legislature and/or Louisiana Wildlife and Fisheries Commission(LWFC). The LWFC is the policy-making body of the Louisiana Department of Wildlife and Fisheries (LDWF) and may rule to close an area if it is deemed to be in the best interest of the state.

All fish species in the state are considered commercial fish except for the sunfish (e.g. bass, bream, warmouth, crappie, striped bass, hybrid striped bass, white bass, yellow bass), billfish (e.g. sailfish and marlin) and red drum (redfish). Examples of freshwater fish in Louisiana include bass, crappie, bream, gar, bowfin, buffalo, and carp. Freshwater shellfish harvested for consumption in Louisiana include crawfish and freshwater shrimp. Some of the freshwater, sport-caught fish/shellfish species (catfish, freshwater shrimp, and crawfish) in Louisiana are also harvested commercially or raised in aquaculture and are available in commercial fish markets.

Saltwater species commonly found in Louisiana coastal areas include red drum (redfish), spotted seatrout (speckled trout), white trout, black drum, croaker, mullet, red snapper, mackerel, blue fish, spadefish, and flounder. Only one inshore saltwater fish, redfish, is not harvested commercially but may be raised in aquaculture facilities. All other saltwater species, with the exception of some off-shore, blue water species, are considered both commercial and sport fish. Shellfish include oysters, crabs, and shrimp and are considered either commercial or sport fish (Reference 1).

### 1.2 Basis of Authority

The Louisiana Office of Public Health (LOPH), the Louisiana Department of Environmental Quality (LDEQ), or the Louisiana Department of Agriculture and Forestry (LDAF) may recommend to LWFC and/or LDWF that the Commission close or regulate fishing in an area due to chemical contamination. The LOPH issues advisories in accordance with Louisiana Revised Statutes (L.R.S.) 40:4A(13), 40:5(20), and 36:258B. The LDEQ issues advisories in accordance with L.R.S. 30:231 and 30:2071. The LWFC functions by authorities presented in L.R.S. 56:5, 6 and 22. The LDWF operates as the enforcement and analytical body of the aforementioned Commission. The LDAF has statutory authority to issue appropriate orders to mitigate and/or remediate pesticide contamination as per L.R.S. 3:3277, 3:3308 and Louisiana Administrative Code 7:13195.

## 2.0 CATEGORIES OF HEALTH ADVISORIES

Chemical contamination of fish tissue sometimes occurs with sediment and/or water contamination. Health advisories can incorporate fish consumption advice as well as recommendations on recreational contact with water and/or sediment. There are five categories of health advisories/bans for fish and shellfish and recreation in Louisiana. These categories were modeled, in part, using EPA guidelines for fish consumption advisories (Reference 2). They include 1) interim health advisory, 2) informational health advisory, 3) fish/shellfish consumption advisory, 4) recreational contact advisory, and 5) ban. The advisory category used is dependent upon site

specific data and information. For example, an advisory may address both fish/shellfish consumption and water recreation. Each category is described below and in Appendix 1.

## 2.1 Interim Health Advisory

An interim health advisory can be any category of advisory or ban but is used when compelling but insufficient data suggest that there may be a health threat to the public. Additional data will be collected and analyzed within six months of imposing an interim advisory to confirm or disprove that a health threat exists. Therefore, the interim advisory is only a temporary alert to the public and will be expanded or lifted depending on the results of additional sampling and analyses. Within one year the interim advisory should be converted to another category or rescinded.

## 2.2 Informational Advisory

An informational health advisory is issued when contamination has been identified and sufficient data exist to evaluate the health risks of the chemical contamination. An informational advisory can be issued when the contamination is documented as occurring however the levels do not exceed health guidelines. In this classification, contamination at low levels is reported to the public. Informational advisories are used to inform the public of potential health risks that may result from recreational activities and/or consumption of fish and shellfish.

## 2.3 Fish and Shellfish Consumption Advisory

A fish and shellfish consumption advisory is issued when sufficient data of chemical contamination exists to support a recommendation to limit the amount of fish and for shellfish that is eaten. Health guidelines may be exceeded and therefore restrictions to the amount and type of fish and/or shellfish that are eaten are needed to protect human health. Fish consumption advisories may recommend no consumption of a specific type of fish or may recommend no consumption by a particular population, such as pregnant and breast-feeding women. They may also include limiting fish and/or shellfish consumption over time. Usually, the fish consumption advisory recommends a certain number of meals per week or month.

## 2.4 Recreational Contact Advisory

A recreational contact advisory warns the public of adverse health consequences from water and/or sediment contamination when engaging in water contact sports in a contaminated water body. Primary water contact sports involve direct contact with water or sediment and include swimming, waterskiing, windsurfing and tubing. Secondary water contact sports include fishing/shellfishing, duck hunting and boating and involve less physical contact with water or sediment. Recreational contact advisories may be issued for primary and/or secondary water contact sports.

### 2.5 Ban

A ban is issued when a prohibition on sport or commercial harvest, or sale of fish and/or shellfish is necessary. In order for the ban to be enforced, the LWFC would issue a rule for LDWF to begin enforcement action. The ban is the most restrictive category and is reserved for areas with high contamination levels and/or extremely toxic chemicals where there is commercial or recreational fishing. A partial ban is issued when only one species of fish is banned commercially or recreationally. In addition to bans on fishing, bans are also issued for water contact sports such as swimming, water skiing, and windsurfing when water quality is heavily impacted by chemical contamination or infectious (bacterial) agents.

## 3.0 HEALTH ADVISORY PROCESS

The health consumption advisory process is based on biota sampling. The recreational contact advisory process is based on environmental sampling. The health advisory and ban process uses a combination of exposure and risk assessment to characterize chemical contaminants at a particular site (Reference 3). Appendix 2 presents a previously published detailed discussion of guidelines used in issuing advisories.

The process to determine the need for an advisory and the means by which that advisory is approved and transmitted to the public is described in the following section.

### 3.1 Determine the Need for an Advisory

#### 3.1.1 Step 1 - Collect and Analyze Samples

The first step in determining a need for an advisory is to obtain information which indicates contaminants are present at levels which may pose a health threat. The LDEQ has an extensive water sampling program. Approximately 160 stations statewide are established for water sample collection. The LDEQ samples fish in areas where fish contamination is suspected due to water or sediment sample results, or where fish contamination is suspected or has been previously documented.

A composite sample is made from the captured fish. A composite is a mixture of ground, skinned, raw, edible fish fillet and results in an "average" contamination level. The composite is comprised of 3 to 5 fish of the same species and size class. Enough fish are collected to analyze at least 3 species. When a large fish is caught, individual fish fillets are used for analysis.

Analysis of the fish is primarily performed by LDEQ laboratories. The LOPH Laboratory Services and LDEQ's laboratory may share the samples to expedite the analyses. If the contaminant is a pesticide or agricultural in origin, laboratory services may also be provided by LDAF. In some instances a private laboratory may be contracted to perform the analysis. The list of target analytes

is based on known contaminants in sediments or waters, known discharges from nearby industries and contaminants such as chlorinated pesticides known to be highly bioaccumulative and therefore likely to be concentrated in aquatic organisms. Quality control and assurance associated with the samples' handling, preparation and analysis is reviewed and meets the requirements of LDEQ, LOPH and/or LDAF.

### 3.1.2 Step 2 - Review and Evaluate Data

Following analysis, data is supplied to LOPH for review. The data is segregated by fish species, location, and when there is sufficient data, by size. An arithmetic mean of contaminant concentration in wet weight is obtained for each species. Concentrations of contaminants which are below the method detection limit are assigned a value of zero and included in the mean. Those contaminants which are at very low average concentrations and do not pose a health threat are eliminated from further consideration.

Sources of toxicity values vary and include Environmental Protection Agency (EPA) cancer slope factor (also called cancer potency factor in Appendix 2) and/or noncarcinogenic reference dose, Agency for Toxic Substances and Disease Registry's (ATSDR) Minimum Risk Levels, individual state or consortium derived toxicity values, Drinking Water Maximum Contaminant Levels and epidemiological values.

The above values are derived from toxicological research performed on animals or microorganisms to determine doses of industrial or hazardous chemicals which have no or a minimal adverse effect on a organ, system or pathway within the organism. Findings from this type of research use safety factors to control for animal tests versus human exposure. For some chemicals, there is sufficient epidemiological data on human exposure to develop toxicity values. Toxicity values available in the literature can differ for the same chemical as the result of varying methods of extrapolation of animal data to human response and reviewer emphasis on carcinogenic or systemic endpoints or susceptible subpopulations. The development of toxicity values is described in further detail in Appendix 2.

### 3.1.3 Step 3 - Perform Exposure Assessment

In order to determine if fish consumption practices present a risk to fishermen and those who consume the catch, the potential for exposure must be considered. Fishing activities at the specific water body may be characterized. Fishermen may be interviewed or creel surveys performed to determine the species and sizes which are commonly consumed. These factors obviously vary according to the area.

Quantity and frequency of fish ingested are also important parameters which must be determined. Fish consumption varies in Louisiana, but is usually estimated to range between 20 and 150 grams of fish per day. Smaller estimates may underestimate the amount of fish eaten by

subsistence fishermen in Louisiana. Therefore, it is important that creel surveys or local knowledge of fishing/shellfishing practices as well as actual consumption levels be considered.

Assumptions used in exposure determination may vary depending on population characteristics. Sensitive sub-populations such as pregnant and breast-feeding women and children are considered during each assessment. Depending on the toxicity data and exposure factors, adjustments are made to protect these sensitive subgroups. The LOPH makes every attempt to use appropriate assumptions of the local habits and behaviors when assessing risk to a particular community. When in doubt about which assumptions accurately reflect the situation, LOPH policy is to consider a worst-case scenario that gives the public more conservative, and therefore, safer recommendations.

#### 3.1.4 Step 4 - Perform Risk Assessment

Risk assessment may be used to compare levels of contaminants ingested through fish consumption to health based values. In calculating risk, a fish meal is considered to be one-half pound of fish (227 grams); the adult body weight is assumed to be 70 kilograms (10 kg for children); the absorption factor of 100% assumes the worst-case scenario (*i.e.*, that the body absorbs all the of chemical contamination present, which may not be the case). The contaminants can be evaluated individually and as contributors to the total risk associated with the area.

An outline of the risk assessment procedure is given as an example of the rationale that supports the individual advisories in Appendix 3. All assumptions for the risk assessment are subject to change depending on available information.

### 3.2 Development and/or Continuation of the Fish Consumption Advisory/Ban

#### 3.2.1 Step 1 - Coordinate Agency Actions

When the exposure and risk assessments indicate the presence of contaminated fish and a population of fishermen likely to consume these fish, members of LDEQ and LOPH meet to discuss and weigh risk management options. An advisory is recommended when the LOPH determines that it is necessary to protect the public health. The Section of Environmental Epidemiology and Toxicology (SEET) develops a draft of the recommended health advisory. In order for the draft advisory to become public record, concurrence must first be obtained from the State Health Officer, the Secretary of the Department of Health and Hospitals, the Secretary of LDEQ and the Secretary of LDWF. The LDAF is involved in writing the advisory if the contaminant is a pesticide or agricultural in origin. Approval by the Commissioner of Agriculture is required for advisories related to agricultural chemicals.

If LOPH determines the need for a ban, a written recommendation is sent by LOPH to LWFC and the secretaries of the three other departments. The Seafood Unit within LOPH is contacted to take actions to protect public health from exposure to biota from the banned area. Once the ban is

approved by the departments, LOPH will present their findings to the Commission to make their recommendations to implement the ban and assist in enforcement through the issuance of a rule. The LWFC considers the request and may rule to close any area that warrants a ban. In an area under a ban, sport fishing would still be allowed but an advisory would recommend catch and release. No commercial fishing is allowed in the banned area and LDWF personnel enforce the various bans throughout the state to ensure that fish/shellfish are not harvested from those areas. The LDWF can enforce bans by size and species of fish for a period of up to three years. After three years, LWFC must rule again to enforce the ban if it is deemed necessary to protect public health. The LDWF is notified by LOPH when the status of any advisory or ban changes so that it can notify fishermen should they request information.

### 3.2.2 Step 2 - Inform the Public

Once all involved agencies agree to the advisory or ban, an announcement is made to the public through a news release in the local and regional area. Following the issuance of the press release, the advisory is provided to the Louisiana State Library for distribution to all state repositories. Concurrently, the health advisory or ban is published in the state newspaper and the *Louisiana Register*. The information concerning the health advisory or ban is also provided to the Governor's Office and cabinet secretaries. The LOPH SEET then coordinates with regional and parish public health staff in the affected area to advise local elected officials and legislators.

Public meetings in local communities may be conducted to explain to local residents the health advisory and the data on which it is based. Actual fish tissue data will be released to the public upon written request to LOPH, LDWF, LDEQ or LDAF, when applicable.

The LOPH/SEET has produced a brochure describing cooking and trimming techniques that can reduce exposure to chemicals which may be found in fish fat and skin. The brochure also includes a summary table of all the current advisories, which is attached in Appendix 4. This brochure is available at local parish health units and through LOPH/SEET offices in New Orleans.

### 3.2.3 Step 3 - Conduct continuous review of affected areas

Chemical concentration averages are commonly tracked for fish/shellfish, water and sediment in each water body under an advisory or ban. A yearly average of the total chemical concentration is kept for the fish caught. Analysis is completed during the year the samples are collected. That is, for the fish sampled that year, an average concentration of the chemical in the fish or shellfish tissue is calculated.

A data review for all the advisories and bans takes place once a year or when new sampling and analyses are available for fish/shellfish, sediment, and/or water. Once the data review and health risk analyses are completed for each advisory or ban, a plan of action is designed to update the advisory or ban and inform the public of any changes in the existing advisory or ban. The updating of the advisories or bans may be categorized into two groups: 1) advisories which must be changed

to reflect the current conditions and 2) advisories that remain unchanged because of little or no change in the analyses. A meeting will be held annually by LOPH, LDEQ, LDWF and LDAF to review and update the protocol document.

Trends in the contaminant data will be evaluated based on the mobility, bioaccumulation, and transport of the chemical(s) of concern. These trends are analyzed to prevent the variability of the data from adversely affecting information necessary for risk management decisions. However, usually only one sampling event of adequate size and unacceptable average chemical concentration data is necessary for issuance or continuance of an advisory or ban. In order to lift an advisory, the average concentration of the last two years of data must be acceptable (*i.e.*, below current health guidelines). Ongoing evaluation will occur to determine the need for changes in the health advice given in the advisories and bans.

If the advisory must remain in effect because health guidelines are exceeded in the trend analysis of the most recent data analyses, the local government is informed. A news release in the community lets the public know that the advisory or ban has been reviewed and contamination is still present. This way, the public and local government are informed on a yearly basis about areas that have previously been determined to pose a human health threat due to chemical contamination. The effectiveness of this public communication process regarding fish advisories/bans is evaluated by LOPH.

#### 3.2.4 Step 4 - Rescind the advisory or ban when contamination levels are at acceptable levels

Advisories may only be lifted after the following criteria are met: 1) a minimum of the most recent two years of environmental data are at acceptable levels (Reference 4), 2) two-year trends have been evaluated depending on mobility, bioaccumulation, and transport of contaminants of concern, and 3) in the case of a ban, a rule is issued by the LWFC rescinding the enforcement action. To rescind an advisory, a rescinding letter is written and approved by the Secretaries of the LDHH (including the State Health Officer), LDEQ and LDWF (and/or LDAF, if necessary).

State officials, state agencies and local elected officials (e.g. mayors, parish councils, and/or police juries) in the area where the advisory is in effect are notified by LDHH. After local and state government are informed of the decision to lift a ban or advisory, a news release is issued in the community and major newspapers.

### 3.3 Recreational Contact Health Advisory Process

The issuance of recreational water and sediment contact advisories due to chemical contamination are also among the responsibilities of the LOPH and LDEQ. These advisories are issued for locations where the water or sediment is contaminated with chemical pollutants to such a degree that adverse human health effects from contact are possible. Recreational activities, such as swimming or tubing, allow for full skin contact with contaminated media and are therefore at

highest risks. A recreational contact advisory is usually issued in conjunction with a fish advisory. If a fish advisory which limits fish consumption is issued with a recreational contact advisory, it is meant to address nonfishing activities which occur such as swimming or wading.

A recreation contact advisory follows the same steps described previously in the fish health advisory process. Samples are collected by LDEQ and analyzed for contaminants. Depending upon the site, the analysis could measure a single contaminant or numerous contaminants. Analytical results are provided to LOPH where a health assessment is performed. A course of action is determined by both LOPH and LDEQ. Since a recreational advisory does not involve fishing or fish consumption, it is not necessary for the LDWF to participate in this process. The LDAF would be involved in the process if the contaminant was related to agriculture. The public is informed of the recreational contact advisory through the media, public meetings and the LOPH brochure mentioned in previous sections. Currently, no actual bans are in effect for recreational activities due to public health concerns.

## 4.0 INSTRUCTIONS TO THE PUBLIC FOR USING ADVISORIES

The public is strongly encouraged to follow the instructions given in each health advisory. It is important to keep in mind that each advisory is individually issued for a particular water body or segment of bayou or river. Likewise, the health advice is also specific to the types and concentrations of chemicals identified at each site (see Appendix 5). Consequently, certain areas may have fish and shellfish consumption limits on specific species while another area may have a total ban on all fish and shellfish consumption. The public should be aware that the health advisory is practical, protective advice reflecting all the best available data.

### 4.1 Sensitive Subpopulations

It is also important to understand that different groups within the general populations are more sensitive and may be considered by LOPH/SEET to tolerate different levels of contamination. Pregnant and breastfeeding women and children require the most cautious and conservative approaches to health and risk analyses because developing fetuses and children are especially sensitive. Also, anglers who may consume large quantities of fish may be at greater risk for exposure to chemically contaminated fish.

### 4.2 Contaminant Reduction Through Cooking

Most contaminants are lipophilic (*i.e.*, the chemicals tend to concentrate in the fat) so methods of preparation and cooking can also protect the public from contaminants in fish. Trimming the fat and skin will reduce the amount of contaminants in the fish. Cooking methods to minimize fat include baking, broiling, and grilling because the fat drains away from the fish (Reference 5). The public is encouraged to discard the juices which contain the fat (and most of the toxins) to further

reduce exposure. Some contamination, like mercury and other heavy metals, however, are pervasive in the edible fish tissue and remain in the fish even after cooking.

## 5.0 NOTIFICATION OF STATE AGENCIES

### 5.1 Where to Report Suspected Fish and Shellfish Chemical Contamination

The public should report suspected fish/shellfish contamination in store-bought or caught fish and shellfish to LOPH, Division of Sanitarian Services, Seafood Unit, 325 Loyola Avenue, Room 206, New Orleans, Louisiana 70112. The Seafood Unit may be reached by telephone at (504) 568-8227. Complaints about fish and shellfish that are suspected of being chemically contaminated are handled by SEET, 234 Loyola Avenue, New Orleans, Louisiana 70112 (Phone (504)568-8537. Office hours are 8:30 am to 4:30 pm Monday through Friday. There is also a statewide toll-free number to LOPH where suspected chemical contamination of aquatic wildlife may be reported (1-800-256-4609).

Oyster harvesting is a major industry in Louisiana, and is strictly regulated by the LOPH Molluscan Shellfish Program. Questions regarding oysters should be directed to that program at the address 210 State Street, Box 436, New Orleans, Louisiana 70118, or phone number (504-896-1378) or the statewide toll-free number (1-800-256-2775). This program monitors bacterial levels in oyster growing areas to determine which area are suitable for harvesting. There is a risk associated with consuming raw shellfish as is the case with other raw protein products. A statewide health advisory warns that if a person suffers from chronic illness of the liver, stomach, or blood, or has other immune disorders, fish/shellfish should be eaten fully cooked. This advisory is required to be prominently posted at all establishments selling raw shellfish for human consumption. It is based on the presence of non-pollutant, naturally-occurring bacteria in uncooked shellfish, as well as the possibility of the presence of pollutant bacteria.

### 5.2 Where to Report Fish and Shellfish Contamination from Biological Agents and Sources

Advisories that involve bacterial or other infectious diseases are handled by LOPH's Division of Sanitarian Services in consultation with the Epidemiology Section of LOPH's Division of Disease Control. Questions regarding bacterial levels in specific water bodies can be answered by contacting Sanitarian Services at (504) 568-5181. Questions regarding diseases caused by bacteria may be answered by the Department of Health and Hospitals, Louisiana Office of Public Health, Epidemiology Section at the address 325 Loyola Avenue, Room 615, New Orleans, Louisiana 70112 and phone (504) 568-5005. All of these offices can also be reached through the statewide toll free number 1-800-256-4609.

## 6.0 SUMMARY

The protocol for Louisiana's fishing and shellfishing advisories and bans is designed to provide standardized guidelines regarding the development and issuance of fish consumption advisories. The LOPH/SEET, in coordination with LDEQ, LDWF and LDAF wishes to inform the public in an expedient manner about the risks of consuming chemically contaminated fish and shellfish as well as risks of recreational activities such as swimming and waterskiing in chemically contaminated waters. State agencies are mandated to protect public health and the environment, provide the public with recommendations that are justified by the most recent and reliable information available, and protect the natural environment in which we all live.

A number of complex issues are considered during the investigation of the need for an advisory. This document attempts to describe the procedures followed in the determination of an advisory while explaining the variations which may occur in each health assessment. The steps in the process such as the investigation of contaminants in fish tissue, the determination of the need for an advisory and the ultimate interagency consultation follow the same procedural steps for each location, but site specific factors may play a large role in the actual advisory. These factors include issues such as contaminated fish or shellfish size and species, distribution of the contaminant within the organism, the presence of single or multiple contaminants, the toxicological properties of the contaminant and lastly, characteristics of the affected population. Similarly, the institution of a recreational contact advisory is dependent upon site specific factors such as the availability of the contaminant to human contact. By describing the protocol used to determine advisories, LOPH/SEET seeks to inform the public of the potential risks of fish consumption while advocating full enjoyment of Louisiana's delicious and abundant fish and seafood resources.

## REFERENCES


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4. Agency for Toxic Substances and Disease Registry, 1992. *Public Health Assessment Guidance Manual*. U.S. Department of Health and Human Services, Public Health Service. Atlanta, Georgia.

5. Anderson, H. A. and Amrhein, J. F., 1993. *Protocol for a Uniform Great Lakes Sport Fish Consumption Advisory*. Great Lakes Sport Fish Advisory Task Force.

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APPENDIX 1

## DEFINITIONS OF FIVE ADVISORY CLASSIFICATIONS

| Advisory Name | Definitive Characteristic | Application |
|---|---|---|
| Interim Health Advisory | Compelling but insufficient evidence of contamination. | A temporary measure to protect health while waiting for more data, has a one year time limit. |
| Informational Health Advisory | Sufficient data shows contamination exists, but at levels below protective health guidelines. | To inform the public that surveillance is ongoing and that their environment is contaminated with low levels of hazardous chemicals. |
| Fish and Shellfish Consumption Advisory | Sufficient data shows levels protective of human health are exceeded. | To warn people to limit consumption of all fish or certain species from a defined area. |
| Recreational Contact Advisory | Sufficient data shows very localized contamination of sediments or water, usually through a spill or abandoned dump site. Fish may be included in a separate advisory for the area. | To warn people against water or sediment contact through swimming, wading and other water contact sports. |
| Ban | Prohibition of harvest or sale of fish or shellfish. *and/or* Prohibition of water contact sports. | Most restrictive type of classification. Prohibition of harvest or sale of fish or shellfish can be enforced by LDWF. |

APPENDIX 2

JOURNAL OF THE LOUISIANA STATE MEDICAL SOCIETY

# HOW TO INTERPRET FISH CONSUMPTION ADVISORIES

written by

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contaminant provided by the food, the edible part of the fish is relevant. If whole body or fat only is analyzed, an estimation of the edible part should be made and the maximum concentration applied to the edible part.

The effects of using composite samples instead of individual samples have been evaluated. The power of the test (the probability of detecting the minimum specified difference) was used as an outcome of the effect of using composite samples. The power of the test increases with the number of samples collected, and the number of subsamples constituting the composite. The main intervening factor was the level of sample variability: for samples with low variability (coefficient of variation = 45) there was little benefit after 3 subsamples in the composite. For samples of average variability (CV = 100) benefits occurred up to 10 subsamples with diminishing returns after 5 (power of 80% achieved at 5 subsamples). At the high level of variability (CV = 200), the benefit of increasing the subsamples were progressing almost linearly to a power of 80% for 25 subsamples.

## SETTING LIMITS

*Maximum allowable concentration for acute toxicity (MAC-1).* The maximum allowable concentration (MAC-1) giving protection against acute toxicity is based on the ADI-1 and a fish meal of half a pound (0.225 kg). MAC-1 (mg/kg) = ADI-1 (mg) / 0.225 (kg)

*Maximum allowable concentration (MAC) and advisory levels (ADL) for chronic toxicity.* The advisory level for chronic toxicity is based on the ADI and a fish consumption of one meal per week (30 g/day: 225 g in one meal multiplied by 52 weeks, divided by 365 days = 32.05 g/day).

Concentrations above the ADL trigger the issuance of advisories recommending restriction of fish consumption until the maximum allowable concentration for chronic toxicity is reached where no consumption would be recommended and a ban sought.

$$\text{ADL mg/kg} = \frac{\text{ADI (mg/kg BW/day)} * 70 \text{ kg BW}}{0.030 \text{ kg fish/day} * \text{AR}}$$

$$\text{MAC mg/kg} = \frac{\text{ADI (mg/kg BW/day)} * 70 \text{ kg BW}}{0.0075 \text{ kg fish/day} * \text{AR}}$$

AR = absorption rate

*Risk based concentration for carcinogen.* The risk calculation is done following this formula:

$$\text{Risk} = \frac{\text{Cpf} * \text{Consumption kg/day} * \text{Consumption fraction} * \text{Tissue concentration mg/kg} * \text{Absorp rate}}{\text{body weight (70 kg)}}$$

The Cpf (carcinogen potency factor) is obtain from tables, expressed in $(mg/kg/day)^{-1}$.

The consumption is the weight (usually in kg day) of the food consumed:

20 g/day for the general population
30 g/day for 1 fish meal/week estimate
22.5 g/day for 3 fish meals/month estimate
15 g/day for 2 fish meals/month estimate
7.5 g/day for 1 fish meal/month estimate

The consumption fraction is the proportion of contaminated food in the total consumption of that food. For example, if the fish from the contaminated area represents only 10% of the total fish consumption, a consumption fraction of 0.10 is used.

The tissue concentration is the mean concentration in the fish samples analyzed. Means are calculated for a representative sample of the fish from the entire area under consideration or from specific areas if it appears that contamination is localized. Means are calculated for all species combined and for individual species as well.

The absorption rate or bioavailability factor represents the fraction absorbed by the gastrointestinal tract. It is estimated from the best toxicological evidence available. In case of lack of data, a 100% bioavailability factor will be used.

The risk is calculated for each consumption level. The consumption level resulting in a risk slightly below $10^{-4}$ is the level recommended in the advisory. For example if a consumption of 7.5 g/day results in a risk of $0.80 \times 10^{-4}$ then the consumption advisory recommends consumption of no more than 1 fish meal per month. If consumption of 30 g/day results in a risk below $10^{-4}$ (1 meal per week) no advisory is issued. The public is simply informed of the results of sampling through a press release.

The level of $1 \times 10^{-4}$ has been carefully selected to provide some balance to the process: The multistage model used does not estimate the actual cancer risk, but the upperbound limits of the risk. Therefore $1 \times 10^{-4}$ means that the cancer risk is less than $1 \times 10^{-4}$.

TABLE 1

COMPARISON BETWEEN FDA TOLERANCES AND ADVISORY LEVELS FROM THE LOUSIANA OFFICE OF PUBLIC HEALTH

| | *Cpf* | *AR* | *FDA tolerance* | *Louisiana OPH* | |
|---|---|---|---|---|---|
| | | | | *ADL* | *MAC* |
| PCB | 7.7 | 0.9 | 2,000 ppb | 35 ppb (1) | 1,400 ppb (1) |
| DDT | 0.34 | 1.0 | 5,000 ppb | 720 ppb (1) | 4,660 ppb (2) |
| Toxaphene | 1.3 | 1.0 | 5,000 ppb | 180 ppb (1) | 7,200 ppb (1) |
| Chlordane | 1.6 | 1.0 | 300 ppb | 120 ppb (2) | 460 ppb (2) |
| HCB | 1.7 | 0.5 | None | 140 ppb (1) | 11,000 ppb (1) |
| HCBD | 0.08 | 1.0 | None | 3,000 ppm (1) | 18,000 ppb (2) |

Cpf = Carcinogen potency factor
AR = Absorption rate
PCB = Polychlorobiphenyls
HCB = Hexachlorobenzene
HCBD = Hexachlorobutadiene
ppb = parts per billion
ppm = parts per million
(1) = OPH ban level based on carcinogenic effect
(2) = OPH ban level based on direct toxic effect

TABLE 2

ADVISORIES IN LOUISIANA

| *Restriction Dates* | *Parish* | *Location* | *Rationale Pollutant* | *Area* |
|---|---|---|---|---|
| Fish consumption Swimming Nov 24, 1987 | St Tammany | Bayou Bonfouca Slidell | Creosote Superfund site | 8 miles |
| Fish coosumption Aug 24, 1983 | East Baton Rouge | Capitol Lake Baton Rouge | PCBs Industrial surface runoff | 0.12 sqmi |
| Fish consumption Swimming Oct 29, 1987 | East Baton Rouge | Devil's-Swamp Baton Rouge | HCB, HCBD, PCB Superfund site | 0.02 sqmi |
| Fish consumption fish, shellfish, seafood Jan 16, 1987 | Calcasieu | Calcasieu river & ship channel Buoy 112-106 | HCB, HCBD Industrial discharges | 11 miles |
| Fish sale & consumption Speckled White Trout Feb 24, 1989; April 1989; Sep 1989 | Calcasieu | Calcasieu river Estuary to Gulf | HCB, HCBD Industrial discharges | 37 miles |
| Fish sale & consumption Feb 16, 1989 | Natchitoches | Sibley Lake | PCB Industiral discharges | 3.4 sqmi |
| Fish consumption Nov 23, 1987 | Ouachita | Wham brake Swartz | Dioxin Industrial discharges | 7.2 sqmi |

Other models would predict risks 10 to 1000 times lower. The surface to surface scaling factor used to obtain the Cpf is also an overestimate that increases the risk estimation.

The combination of these very conservative assumptions with a $10^{-4}$ or even a $10^{-3}$ risk level would lead to extremely low concentrations that could not be reasonably justified. Table 1 shows that the concentrations resulting from Louisiana OPH assumptions and a $1 \times 10^{-4}$ risk are low in comparison with the FDA tolerances and, thereby, well within reasonable limits justified by the need to protect population with high fish consumption.

Several contaminants may be present in the same area. In this case the risks resulting from each of the contaminants is calculated separately and then added. The total risk is considered for the final determination.

*MACs and ADLs used in Louisiana.* The MAC and ADL used in Louisiana for some of the most commonly found contaminants (provided they occur alone) are presented in Table 1. FDA tolerances which are levels at which the fish could not be sold, corresponding to maximum allowable concentrations are also presented. In Louisiana, bans could not be implemented by the Office of Public Health, but recommendations would be made to the Department with authority to implement a ban at a risk level of $10^{-3}$ for a consumption of 1 fish meal per month. The ban levels are slightly lower than the FDA tolerances. A list of advisories in place in Louisiana is presented in Table 2.

When setting action levels, trigger thresholds, and advisories, there is no one correct level of contamination to serve as a basis. Rather, the basis can be only that set by society through the processes of the agencies. The responsibility of policy makers is to bring the state of the art and scientific knowledge about the chemical, biological, and ecological dynamics together with economic and other societal factors. Sound judgments can be made. Such a prudent course should lead to a cleaner, safer, and more thriving natural and human environment.

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The goal of this paper is to explain the guidelines used in Louisiana to issue advisories against consumption of chemically contaminated seafood or fish and explain some of the uncertainties encountered. In the absence of federal regulations the State had to develop its own approach. The concentrations resulting from Louisiana policies are generally low in comparison with the FDA tolerances and, thereby, well within reasonable limits justified by the need to protect populations with high fish consumption.

THE GOAL of this paper is to review the issues to be considered to prevent adverse health effects from consumption of chemically contaminated fish (or seafood) and to explain the guidelines used in Louisiana to issue advisories against consumption of chemically contaminated seafood or fish.

Scientific knowledge is usually adequate to justify preventive measures against direct toxic effects of environmental exposure to hazardous agents. However, this knowledge is somewhat inadequate when it comes to carcinogenic effect. Sound decisions can only be made after a thorough review of the available scientific and circumstantial data on a case-by-case basis.

The responsibility for monitoring foods for environmental contamination is with the FDA (Food and Drug Administration) and USDA (US Department of Agriculture). USDA limits its monitoring activities to meat and poultry but is now developing a seafood program. The FDA has a broader responsibility with a focus on protecting food supplies that move in interstate commerce. States have the responsibility of providing guidance or regulation at the state level for edible fish and seafood.

Ideally, no chemical contaminant should be tolerated in the food supply. This utopic approach, while providing ample stimulus for social and political debate, does not serve well as a practical basis for policy development, improvement of the food quality, and disease prevention, since chemical contamination is ubiquitous in itself and defies practical definition. Real progress will be made by knowing and understanding the extent of chemical contamination, setting priorities, and removing the most harmful contaminants first.

*Tolerance, maximum allowable concentrations, advisory levels.* Tolerances (maximum allowable concentrations or MAC) are levels of contamination set by the FDA above which the food is seized and its consumption prohibited. Tolerances are set so that consumption of food at this level does not cause any demonstrable adverse health effect and therefore is acceptable. Carcinogenicity presents a difficult problem because of the uncertainties involved in determining the carcinogenic risk. Present scientific knowledge is not sufficient to make a definite determination.

When the consumption of a particular food may be associated with a small increased carcinogenic risk, a fair approach to deal with the incertitude is to share it with the concerned population and let the individuals make their own informed decisions. Persons will weigh the pros and cons. Advisories are the mechanism used to inform the public about small and uncertain potential hazards. An advisory should communicate the risk to the target population, explain the incertitudes, and provide sufficient information for the individual to make an educated choice. It is not necessary to understand all the intricacies of the carcinogenic risk assessment nor to have a degree in toxicology to make an educated choice. After all, people choose to climb mountains without an extensive knowledge of the laws of gravity, kinetic energy, and complete statistical description of the fatalities or injuries suffered by mountain climbers.

*Criteria for setting acceptable levels for advisories.* The following information is considered in the decision to issue advisories or set tolerances:[1,2]

- Toxicologic data: acute and chronic toxicity (carcinogenic and noncarcinogenic), absorption, metabolism, and degradation of the substance;
- Exposure data: concentration of the contaminant in the food supply and in the specific commodities under consideration; amount of food ingested by the populations; manner of food preparation and consumption.
- Host susceptibility of certain population that may be at greater risk from exposure to the contaminant: infants, pregnant women, aged, persons with idiosyncratic response or with underlying diseases.
- Analytical considerations: levels of detection, identification of the contaminant.
- Feasibility of monitoring and enforcing compliance with the set levels.
- Impact of the various levels on the food supply and availability.

*Setting an acceptable daily intake for noncarcinogens.* The first task is to assemble and evaluate all available information on the toxicity of the contaminant. From the data obtained a No Observed Effect Level (NOEL) is calculated and expressed in mg/kg of body weight/day. NOEL may be expressed for 1 day exposure or long-term exposure.

From the NOEL, an Acceptable Daily Intake (ADI mg/kg/day) is calculated. This is achieved by dividing the NOEL by a safety factor. "Acceptable" denotes that there is no absolute safety for 100% of persons exposed. The safety factor may vary from 10 to 1000 depending on the knowledge available on human exposure to known levels of the contaminant.

For example, a NOEL may be 100 mg/kg in extensive studies carried out on animals close to humans. Some accidental human exposure data may also be available confirming animal studies. A safety factor of 10 is chosen, therefore an ADI of 10 mg/kg (100 mg/kg divided by 10) is set. For another compound with a NOEL of 100mg/kg, studies may only be available in small mammals and no human exposure data are available. Therefore a larger safety factor of 1000 may be chosen. An ADI of 0.1 mg/kg is then set (100 mg/kg divided by 1000).

In the United States, the Environmental Protection Agency's Reference Doses are acceptable daily intakes. They are an estimate of the daily exposure (mg/kg/day) to the general population (including sensitive groups) that is likely to be without an appreciable risk of deleterious effects (including adverse developmental and reproductive health effects) during a lifetime of exposure. Acceptable (1 day) daily intakes (ADI-1) are also estimated.

*Risk assessment based procedures for carcinogens.* For carcinogenesis, a different approach has been proposed to palliate the paucity of scientific data on the dose-cancer relationship at the extremely low doses considered. The approach used in the United States is to use a cancer risk assessment model. The rationale is that for consumption of a known quantity of suspected or confirmed carcinogen, science may predict a resulting increased risk of cancer. Mathematical models are used to make these predictions.

The main assumptions used by these models are:

- That for carcinogens there is a risk to human health at any exposure concentration (no threshold assumption),
- That adverse effects in experimental animals are indicative of adverse effects on humans (animal to human assumption).

The no threshold assumption is well-suited for radiation carcinogenicity and for certain chemicals, at least in susceptible individuals. However, chemical carcinogenicity is complex: there are initiators, promoters, cocarcinogens and complete carcinogens. Lumping all chemical carcinogens into the same category is simplistic. For example, there is considerable evidence that promotion of cancer is a threshold biological process.

The assumption that humans are going to respond as the most sensitive animal species is not always true. For dioxins, for instance, human responses are halfway between the least and the most sensitive species.

Other assumptions made are: (1) the cumulative incidence of cancer increases with the third power of age (this has been used to estimate lifetime incidence when data is available only from less than lifetime experiments); (2) average doses are an appropriate measure of exposure dose, even if dose rates vary over time; (3) the effective dose (or target organ dose) is assumed to be proportional to the administered dose; (4) risk from multiple exposure in time is additive; (5) the absorption efficiency of humans is equal to that of the experimental animal; and (6) for chemical mixtures, risk of individual chemicals are additive not synergistic.

The Carcinogen Assessment Group of the EPA uses a linearized multistage procedure to estimate carcinogenic risks. This model assumes that carcinogenesis results from a series of interactions between the carcinogenic chemical and the cell's DNA, with the rate of interactions linearly related to the dose. There is an entire spectrum of other models available. At low dose, the multistage model yields risk estimates up to 10,000 times higher than models at the other end of the spectrum.

These models are hypothetical; the multistages are phenomenologic, they have no clear biologic entity. Carcinogens are assigned a cancer potency factor (Cpf) which is an upper-bound estimate. Depending on the animal studies and the scaling factor used for the estimation of these factors, one may come up with different factors: for example dioxin Cpf ranged from 9,700 to 156,000.

*Risk.* Risk assessment will produce a hypothetical carcinogenic risk associated with the exposure (consumption) level over a lifetime. These hypothetical

risks are used to determine acceptable levels of consumption.

The real risk of developing cancer over a lifetime in developed countries is around 0.25 to 0.30. An additional hypothetical risk of $10^{-4}$ or 1/10,000 would therefore increase that risk to 0.2501 to 0.3001.

Risks frequently used range from $10^{-3}$ to $10^{-6}$. There is no general agreement on risk levels: a survey of states' practices showed that 18 had no set levels, 1 used the $10^{-4}$ level, 8 used a $10^{-5}$ level, 9 used a $10^{-6}$ level, the rest did not use risk assessments.[3]

Other factors besides the risk level will be important in the determination of a contaminant level. The food consumption assumptions are important to consider. Some agency may use a $10^{-5}$ risk level associated with a low consumption assumption and end up with a less stringent standard than another agency using a $10^{-6}$ risk with a higher consumption level.

*Target population and fish consumption.* The estimates by EPA in 1980 of average consumption of fish and seafood from estuarine and fresh waters by the average US population were 6.50 g/day. This estimate is used in a majority of risk assessment procedures. Another fish consumption assumption from USDA in 1984 used for states assumed to have higher fish consumption is 20 g/day. This is the consumption estimate used for the Louisiana general population. Less than 10% of the population is estimated to consume 165 g/day.

The model used considers fish consumption over a 70-year lifetime. People eat a variety of fish species throughout their life. The proportion of a single species in the consumption of fish of an entire population can be deducted from the composition of the fish catch and fish consumption surveys.[4]

There are several studies of fish consumption by sport fishermen and ethnic groups fond of fish. In a study of sport fish consumption by Wisconsin anglers, the mean number of sport caught fish meals was 18 per year, the mean number of nonsport caught fish meals was 24, the total mean fish meal number was 42.[5] These anglers were bringing back a mean of 33.2 kg (73 lbs) per year. The most common species represented 40% of the total catch. Puffer[6] conducted a study of sport fishermen in the Los Angeles area: the mean fish consumption was 37 g/day.

Advisories must be targeted at a specific population. The populations to be considered are:

- The population that eats small amounts of fish from the general food supplies (supermarkets and local fish markets). Part of the fish comes from canned or processed preparations (fish sticks, frozen fillets). Current estimates are that the consumption by this population is 6 g to 20 g of fish per day with 10% from local suppliers.
- The population that eats a larger amount of fresh fish and seafood from local suppliers. Consumption by this population is 20 g per day and 50% from local suppliers.
- The population of sport fishermen and immediate families that eat large amounts of fish and seafood caught locally. This population is assumed to eat 30 to 50 g per day and 80% to 100% coming from the catch.

The average meal size ranges from 4 to 8 ounces (120-240 g), 225 g being the most commonly used assumption for an adult. Children, assumed to eat fish portions in proportion to their weight, would consume 3 g of fish per kg of body weight per fish meal. Advisories are often issued by recommending limits on the number of fish meals per month. Advising to limit consumption to one fish meal per week is equivalent to consumption of 30 g/day (225 g in one meal multiplied by 52 weeks, divided by 365 days = 32.05 g/day).

*Sampling of the fish.* The sample of fish on which the advisories are based should be representative of the fish species caught and eaten from the area under consideration. Ideally a survey of the fish caught and of the consumption pattern in an area should be made. This is usually impractical and one will have to rely on reasonable assumptions. Samples are often taken in order to monitor the points of high contamination, plus a few samples downstream from the "hot" spots to evaluate the magnitude and distribution of the contamination. This is a perfectly valid consideration but applying the results of this type of sampling to evaluate the total catch from an area may be misleading.

To assess the risks associated with eating a given fish or type of seafood the following average tissue concentrations should be considered:

— over the period of record
— by station and area-wide (estuary)
— by species
— for all species combined
— repeat the process of area-wide average after exclusion of banned station

Since the purpose is to evaluate the amount of ►

## APPENDIX 3
## SUMMARY OF RISK ASSESSMENT

The methodology used in Louisiana for determining risks to the public of consuming chemically contaminated fish has been developed by LOPH medical and toxicological staff with guidance from the EPA. The basic calculation procedure is outlined below.

1) Identify contaminants of concern using federal and state health guidelines for environmental media.

2) For each identified contaminant, calculate the arithmetic mean chemical concentration ($C_T$) in wet weight for edible fish fillet samples, sediment, soil and water.

3) With the average concentration, calculate a potential exposure dose assuming every fish meal is contaminated at the average concentration level of the contaminant.

$$\text{Exposure Dose} = \frac{C_T \times CR \times AF}{BW}$$

where;

$C_T$ = average contaminant concentration in fish tissue (wet weight)
**CR** (consumption rate) = 30 gram/day of chemically contaminated fish for adults (one 8 ounce meal per week)
**AF** (absorption factor) = 1.0 or other fraction if research shows absorption to be less than 1.0, and
**BW** (body weight) = 70 kilograms for adults and 10 kilograms for children.

4) For each contaminant that has a noncarcinogenic toxic effect, compare the calculated dose to a health guideline (EPA oral reference dose (RfD) or ATSDR minimal risk level (MRL)). Express this comparison as the Margin of Exposure (MOE).

MOE = Exposure Dose/Health Guideline Value

Add all MOEs together if the fish tissue is contaminated with multiple chemicals which have the same primary target organ to determine total noncancer risk. If multiple contaminants are present which target different organs, then MOEs should not be added together.

The total MOE should be less than 1.0 since the EPA oral reference dose is defined as the daily exposure level which, during a human lifetime, appears to be without appreciable risk on the basis of all facts known at the time. If the calculated dose is greater than the health guideline, i.e. RfD or MRL, a possible health threat exists.

5) If the contaminant of concern is a carcinogen, calculate the cancer risk using the dose, the exposure factor and the cancer slope factor (cancer potency factor). For exposure dose (for carcinogenic risk), only life-time adult parameters are used since the multi-stage model is used. There is no cancer risk prediction model for children.

Cancer Risk = Exposure Dose x CSF x EF

where;

**CSF** (cancer slope factor) = obtained from EPA or other source
**EF** (exposure factor) = (exposure frequency x exposure duration) / (time period over which the dose is to be averaged). Usually for the protection of public health, the exposure factor is assumed to be 1.0 unless other information on consumption is available.

Add cancer risks together if multiple carcinogenic chemicals are present to determine total cancer risk. The sum of cancer risks should be $1 \times 10^{-4}$ or less. A description of this cut-off point of acceptable cancer risk is described in Appendix 2.

6) To determine whether the advisory should be a consumption advisory or a complete ban, the consumption rate is varied to determine if there is a level of consumption that represents a reasonable risk. One half pound of fish consumed in one meal which is equivalent to 227 grams of fish is the standard meal size assumption. This value is converted from an amount per meal to an amount per day for use in calculations.

The following standard consumption rates are used:

| | |
|---|---|
| 4 meals/month (1 meal/week) | = 30 g/day |
| 2 meals/month (0.5 meal/week) | = 15 g/day |
| 1 meal/month | = 7.5 g/day |

7) For a consumption advisory, determine what number of meals per month represents an acceptable risk. As discussed above and in Appendix 1, an acceptable risk typically has an MOE of less than or equal to one and a cancer index of less than or equal to $1 \times 10^{-4}$. This concept is further explained in Appendix 2.

8) Proceed with advisory process as stated in text for all environmental media. Risk assessments are performed using different assumptions for biota, sediment, soil and surface water. Similar reasoning as that above is used for each environmental media.

9) Risk assessment methodology is of a highly conservative nature. Every fish meal is considered to be contaminated at the average concentration of contaminant in the edible fish tissue. Contaminated fish (at the average concentration level) are assumed to be eaten at a rate of 30 grams per day or one 8 ounce fish meal per week for seventy years. Consumption rates vary across the nation but for the Louisiana public, one fish meal per week (30 grams per day) is appropriate considering the large number of sport fishermen and proximity to marine, estuarine, and freshwater fishing/shellfishing. The fish consumption rate may change if knowledge of local consumption is obtained. In addition, most contaminants do not have absorption studies and consequently the worst-case scenario of 100% absorption is used.

# APPENDIX 4

# LOUISIANA CHEMICAL CONTAMINATION FISHING ADVISORIES

| LOUISIANA CHEMICAL CONTAMINANT FISHING ADVISORIES | | | | |
|---|---|---|---|---|
| FISH AND SHELLFISH CONSUMPTION HEALTH ADVISORIES (DATES) | PARISH | LOCATION | POLLUTANT | AREA |
| Fish consumption by pregnant women, breastfeeding women and children less than 7 years of age, no bowfin (choupique) consumption; largemouth bass, crappie (sac-a-lait) or freshwater drum no more than 1 meal a month. Other people should limit bowfin to 2 meals per month; no consumption limit on other species. (issued 10/96) | Acadia, St. Landry | Bayou Plaquemine Brule | Mercury | 40 mi. |
| Fish/shellfish consumption of no more than 2 meals a month; no swimming, water sports & contact with bottom sediments (issued 1/87; reviewed 4/92 and 10/94) | Calcasieu, Cameron | Bayou d'Inde | HCB, HCBD, PCBs | 6 miles |
| No fish consumption; Sediment contamination (issued 8/83; reviewed 11/94) | East Baton Rouge | Capitol Lake | PCBs | 0.12 sq.mi. |
| Fish consumption of no more than 2 meals a month, no water contact sports, no swimming (issued 10/87; expanded advisory area 7/93) | East Baton Rouge | Devil's Swamp, Devil's Swamp Lake, Bayou Baton Rouge | HCB, HCBD, PCBs, lead, mercury, arsenic | 7 sq.mi. |
| Fish consumption by pregnant women, breastfeeding women and children less than 7 years of age, no bowfin (choupique) consumption; largemouth bass, white bass or crappie (sac-a-lait) no more than 1 meal a month. Other people should limit bowfin to 2 meals per month; no consumption limit on other species. (issued 10/96) | Natchitoches | Black Lake | Mercury | 7.6 sq. mi. |
| **Instructions on proper fish trimming, cleaning and cooking must be followed.** Select one of the two options: largemouth bass or crappie - 1 meal/week; or channel cat, stripped bass - 1 meal/month. Do not eat shad, gar or carp. (issued 2/89, reviewed 6/94, revised 1/96) | Natchitoches | Sibley Lake | PCBs | 3.4 sq.mi. |
| No fish consumption (issued 11/87; reviewed 3/94) | Ouachita, Richland, Morehouse | Wham Brake near Swartz | Dioxin | 7.2 sq.mi. |
| Fish consmption of all species of no more than 2 meals per month (issued 3/94, reviewed 12/96) | Ouachita, Richland Morehouse | Bayou Lafourche from Highway 80 overpass to I 20 | Dioxin | 2 miles |

| LOUISIANA CHEMICAL CONTAMINANT FISHING ADVISORIES | | | | |
|---|---|---|---|---|
| **FISH AND SHELLFISH CONSUMPTION HEALTH ADVISORIES (DATES)** | **PARISH** | **LOCATION** | **POLLUTANT** | **AREA** |
| Fish consumption by pregnant women, breastfeeding women and children less than 7 years of age, no bass consumption; other fish species no more than 2 meals a month. Other people should limit bass to 2 meals per month; no consumption limit on other species. (issued 7/92; reviewed 8/94) | Ouachita, Union, Morehouse, Caldwell | Ouachita River: LA/ARK border to lock at Columbia | Mercury | 102 miles |
| Fish consumption by pregnant women, breastfeeding women and children less than 7 years of age, no more than 1 meal per month of largemouth bass, crappie and freshwater drum. (issued 1/96) | St. Martin | Henderson Lake | Mercury | 37.8 sq. mi. |
| No fish consumption, swimming, sediment contact (issued 11/87) | St. Tammany | Bayou Bonfouca, Slidell | Creosote | 7 miles |
| Fish consumption by pregnant women, breastfeeding women and children less than 7 years of age, no more than 1 meal per month of all bass species or bowfin (issued 8/96) | St. Tammany, Washington | Bogue Chitto River from LA/MS border to Pearl River Navigation Canal. | Mercury | 35 mi |

| **INFORMATIONAL HEALTH ADVISORIES (DATES)** | **PARISH** | **LOCATION** | **POLLUTANT** | **AREA** |
|---|---|---|---|---|
| Long-term fish consumption may increase health risks (issued 4/92; reviewed 4/92 and 10/94) | Calcasieu, Cameron | Calcasieu Estuary | HCB, HCBD, PCB | 37 miles |
| Sediment contamination (issued 1/89; reviewed 10/94) | Calcasieu | Bayou Olsen at Lake Charles | chloroform, misc. chemicals | 0.5 miles |
| Long-term fish consumption may increase health risk (issued 2/92) | Franklin, Tensas, Madison, Richland | Tensas River | DDT, Toxaphene | 83 miles |

- For more information contact the Louisiana Office of Public Health Section of Environmental Epidemiology and Toxicology (540) 568-8537 or your local Parish Health Unit Sanitarian

- Date - December 1996

LOUISIANA DEPARTMENT OF HEALTH AND HOSPITALS
OFFICE OF PUBLIC HEALTH

# FISH CONSUMPTION ADVISORY FOR BAYOU D'INDE

DATE: April 7, 1992

The Louisiana Department of Health and Hospitals and the Louisiana Department of Environmental Quality are issuing the following fish consumption advisory.

Traces of chemical contamination (Hexachlorobenzene [HCB] and Hexachlorobutadiene [HCBD] and Polychlorobiphenyls [PCB]) continue to be detected in samples of fish from the Bayou d'Inde area in the Calcasieu Estuary.

The advisory previously in place is modified now in response to additional scientific information. We advise that the consumption of fish and seafood from these waters should be limited to 2 meals per month (a meal considered to be half a pound of fish for an adult). Recommendations made in this advisory have taken into account individuals with special sensitivities, pregnant women and children.

HCB and HCBD are organic chemicals formed in very low concentrations as a by-product in the preparation of other chemicals. The doses found are well below those that would make you sick. In humans, the effects of the consumption of extremely low doses over long time are not known. Since it is possible that long term consumption could cause health effects, it is prudent to restrict the exposure to these chemicals to the minimum.

The public is reminded of the advisory against swimming and contact with sediments in the bayou d'Inde area.

Traces of industrial or agricultural chemicals as well as some natural chemicals are frequently present in fish, seafood, meat and poultry. High consumption of food contaminated with these chemical residues over a long time may increase the risk of cancer or other diseases. The chemicals are usually more concentrated in the fat. Such chemical contaminants are undesirable and should be eliminated.

To cut down the exposure to these chemical contaminants, you should trim the fat from fish, seafood, meat and poultry prior to cooking; bake, broil or grill, then drain the fat; vary your diet by eating a variety of fishes, seafood, meat and poultry from different sources.

For more information, contact the Water Pollution Control Division, Department of Environmental Quality, at 504-765-0634 or the Environmental Epidemiology Section, Office of Public Health, at 504-568-8537.

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## FISH CONSUMPTION ADVISORY FOR BAYOU PLAQUEMINE BRULE

Based on fish sampling in Acadia Parish, unacceptable levels of mercury have been detected in certain species of fish taken from Bayou Plaquemine Brule near Jennings. This area includes Bayou Plaquemine Brule from its origin near Opelousas in St. Landry Parish to where it enters the Mermentau River. *Therefore, the Louisiana Departments of Health & Hospitals, Environmental Quality, and* Wildlife & Fisheries advise that the following precautions be taken when eating fish taken from Bayou Plaquemine Brule.

- **Pregnant women, breastfeeding women and children less than 7 years of age should consume NO bowfin/choupique *AND* should eat no more than ONE MEAL PER MONTH of either largemouth bass, crappie/sac-a-lait or freshwater drum/gaspergou. (A meal is considered to be half a pound of fish for adults and children.) There is no consumption limit on other species of fish.**

***AND***

- **Non-pregnant women and men and children 7 years of age or older should limit consumption of bowfin/choupique to TWO MEALS PER MONTH. There is no consumption limit on other species of fish.**

Mercury is an element that occurs naturally in the environment. It is released into the atmosphere through natural processes and human activities. Consequently, there are small amounts of mercury in lakes, rivers and oceans. Nearly all fish contain trace amounts of mercury. They absorb mercury from the water and sediment as they feed on aquatic organisms. Larger predator fish contain more mercury than smaller fish. Therefore, it is recommended that smaller fish be consumed instead of larger ones.

People are exposed throughout their lives to low levels of mercury. One way they can be exposed to mercury is from eating contaminated fish. Health effects from harmful levels of mercury can include nervous system and kidney damage. Developing fetuses are more sensitive to the toxic effects of mercury, especially in the first trimester. In addition to developing fetuses, infants and children are more sensitive to the effects of mercury, therefore, consumption advisories are issued at lower tissue concentration levels for these groups.

This advisory is issued as a precaution. Further sampling will be carried out to determine if this advisory is to be continued or modified. If you have consumed fish, even largemouth bass, black or white crappie/sac-a-lait, freshwater drum/gaspergou or bowfin/choupique from these waters, it is not likely that there is an immediate need to be concerned about the effect of mercury. For specific symptoms, though, your own physician should be consulted.

10/8/97

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# FISH CONSUMPTION ADVISORY FOR BLACK LAKE

Based on fish sampling in Natchitoches Parish, unacceptable levels of mercury have been detected in certain species of fish taken from Black Lake. This area includes Black Lake only. Therefore, the Louisiana Departments of Health & Hospitals, Environmental Quality, and Wildlife & Fisheries advise that the following precautions be taken when eating fish taken from Black Lake.

- **Pregnant women, breastfeeding women and children less than 7 years of age should eat NO bowfin/choupique *AND* should limit consumption of largemouth bass, white bass or crappie/sac-a-lait to ONE MEAL PER MONTH. (A meal is considered to be half a pound of fish for adults and children.) There is no consumption limit on other species of fish.**

***AND***

- **Non-pregnant women and men and children 7 years of age or older should limit consumption of bowfin/choupique to TWO MEALS PER MONTH. There is no consumption limit on other species of fish.**

Mercury is an element that occurs naturally in the environment. It is released into the atmosphere through natural processes and human activities. Consequently, there are small amounts of mercury in lakes, rivers and oceans. Nearly all fish contain trace amounts of mercury. They absorb mercury from the water and sediment as they feed on aquatic organisms. Larger predator fish contain more mercury than smaller fish. Therefore, it is recommended that smaller fish be consumed instead of larger ones.

People are exposed throughout their lives to low levels of mercury. One way they can be exposed to mercury is from eating contaminated fish. Health effects from harmful levels of mercury can include nervous system and kidney damage. Developing fetuses are more sensitive to the toxic effects of mercury, especially in the first trimester. In addition to developing fetuses, infants and children are more sensitive to the effects of mercury, therefore, consumption advisories are issued at lower tissue concentration levels for these groups.

This advisory is issued as a precaution. Further sampling will be carried out by LDEQ to determine the need for modifications to this advisory. If you have consumed fish, even white or largemouth bass, crappie/sac-a-lait or bowfin/choupique from these waters, it is not likely that there is an immediate need to be concerned about the effect of mercury. For specific symptoms, though, your own physician should be consulted.

10/8/97

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LOUISIANA DEPARTMENT OF NATURAL RESOURCES

# PRESS RELEASE

August 23, 1983

The Water Pollution Control Division of the Louisiana Department of Natural Resources has verified earlier findings concerning PCB contamination in fishes collected from Capitol Lake in Baton Rouge. Laboratory results completed today indicate levels of PCB's (Polychlorinated Biphenyls) and of several isomers of the pesticide chlordane that in one edible fish tissue sample exceed the "Action Level" established by the U.S. Food and Drug Administration. A second sample of edible tissue closely approaches the PCB Action Level and exceeds the total chlordane Action Level.

These samples were from yellow bullheads which are small catfishes closely related to the familiar channel catfish.

Additional analyses were performed on a whole body basis for specimens of the same species to confirm earlier whole body analyses completed in late July, 1983, on fishes collected in June.

These latest results are listed below:

1) Edible portion (filet) - Yellow Bullhead
(Fish size: Length - 13 inches Weight - 12 ounces)

| | |
|---|---|
| Total PCB | 6.502 parts per million (ppm) |
| Total chlordanes | 0.527 ppm |
| Total DDT and metabolites | 2.658 ppm |

2) Edible portion (filet) - Yellow Bullhead
(Fish size: Length - 10 inches Weight - 8 ounces)

| | |
|---|---|
| Total PCB | 4.635 ppm |
| Total chlordanes | 0.312 ppm |
| Total DDT and metabolites | 1.862 ppm |

3) Whole fish body - Yellow Bullheads
(Composite sample of 3 specimens: 6 - 10 inches in length and 4 - 7 ounces in weight)

| | |
|---|---|
| Total PCB | 18.068 ppm |
| Total chlordanes | 1.761 ppm |
| Total DDT and metabolites | 12.470 ppm |

Food and Drug Administration (FDA) action levels for the above compounds are as follow:

| Compound Category | FDA Action Level |
|---|---|
| Total PCB | 5.000 ppm |
| Total chlordanes | 0.300 ppm |
| Total DDT and metabolites | 5.000 ppm |

It must be noted that the FDA levels apply only to analyses of edible portions of fish and cannot be directly correlated to whole body analyses.

These findings have been forwarded to the Louisiana Department of Health and Human Resources (LDHHR) in New Orleans for that agency's review and evaluation. Additionally, representative fish specimens collected by Department of Natural Resources field personnel are being delivered to LDHHR Bureau of Laboratories for further analyses of edible portions.

The Department of Natural Resources is continuing to conduct its investigation of this situation to ascertain the extent of the contamination in Capitol Lake and to determine the sources of the contamination. The department's preliminary assessment of this situation indicates a gradual buildup of these contaminants over a period of years from urban runoff from the industrialized region of Baton Rouge that is subject to drainage to the lake. There is no evidence at this time that the present situation has resulted from a major spill or intentional dumping incident.

As sources of contamination are identified and documented, the Water Pollution Control Division will make recommendations to the Assistant Secretary for the Office of Environmental Affairs (LDNR) and the Louisiana Environmental Control Commission concerning applicable remedial and enforcement actions.

Included as attachments are four laboratory analytical reports presenting all data for fish samples (whole body and edible portions) analyzed to date.

LOUISIANA

Department of HEALTH and HOSPITALS

Christopher Tilley SECRETARY

Louisiana Department of Environmental Quality

DEPARTMENT OF HEALTH AND HOSPITALS
DEPARTMENT OF ENVIRONMENTAL QUALITY

HEALTH ADVISORY FOR THE DEVIL'S SWAMP
AND BAYOU BATON ROUGE AREA

July 9, 1993

The Louisiana Department of Health and Hospitals and the Louisiana Department of Environmental Quality are issuing the following health advisory for the Devil's Swamp and Bayou Baton Rouge areas of East Baton Rouge Parish. The area of concern is bounded on the north by Hall Buck Marine Road, on the east by the bluffs and the Baton Rouge Barge Harbor and on the south and west by the Mississippi River.

This advisory modifies a previous advisory in response to recent sampling and analysis of environmental data.

Water and sediment sampling and analyses south of the Petro Processors Superfund site indicate arsenic, lead, mercury, hexachlorobenzene (HCB) and hexachlorobutadiene (HCBD) contamination is present at levels that pose risks to public health. Therefore, the public is advised not to swim nor participate in other primary water contact sports in the area of concern.

Additionally, elevated levels of HCB, HCBD, and mercury have been found in some samples of fish from this area. Because of the levels of contamination, the agencies are advising that consumption of all fish species from these waters be limited to two (2) meals per month. A meal is considered to be one-half (1/2) pound of fish. Recommendations made in this advisory have taken into account individuals with special sensitivities such as children and pregnant women.

This advisory is based on samples taken from both Devil's Swamp and Bayou Baton Rouge. However, the area of concern extends beyond the sampled area. When additional data become available, the boundaries of the advisory will be adjusted, if necessary, to reflect the results of the new information.

High consumption of food contaminated with these chemical residues over a long period of time may increase the risk of cancer or other diseases. The chemicals are usually more concentrated in the fat and skin.

To reduce the risk of exposure to these chemical contaminants, you should trim the fat and skin from fish prior to cooking; bake, broil or grill, and then drain the fat; vary your diet by eating a variety of fish, seafood, meat and poultry from different sources.

For more information regarding this advisory, contact Emelise Cormier, DEQ-Water Resources at 504-765-0634, Tom Stafford, DEQ-Inactive and Abandoned Sites at 504-765-0487, or Jennifer Goodwin, DHH-Office of Public Health, 504-568-8537.

Larry Hebert, M.D.
Assistant Secretary and State Health Officer - Dept. of Health and Hospitals

Dale Givens
Assistant Secretary - Dept. of Environmental Quality

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# FISH CONSUMPTION ADVISORY FOR SIBLEY LAKE

The following consumption advisory is issued by the Louisiana Departments of Health & Hospitals, Environmental Quality, and Wildlife & Fisheries for fish contaminated with polychlorinated biphenyls (PCBs) at Sibley Lake located near Natchitoches, Louisiana. This advisory supersedes a previous more restrictive fish consumption advisory for that lake.

Although gar, shad and carp in Sibley Lake are the fish species with the highest levels of PCBs and should not be eaten, surveys of fishing in the lake indicate these species are rarely caught by sport fishermen. Crappie, channel catfish and largemouth bass are caught more often than any other kind of fish at Sibley Lake and they generally have the lowest levels of PCBs.

In order to protect your health the following instructions MUST be followed:

- Fish must be completely skinned and trimmed of fat. Broil, grill, or bake the trimmed, skinned fish on a rack so that fat drips away. DO NOT FRY THE FISH!

AND

WITHIN ANY ONE MONTH TIME PERIOD, eating fish from Sibley Lake should be limited to ONLY one of the following two options:

- One meal* per WEEK of largemouth bass or crappie.

OR

- One meal* per MONTH of channel catfish, striped bass or other species (excluding gar, shad and carp).

* A meal is considered to be half a [illegible]

M.J. "Mike" Foster, Jr.
GOVERNOR

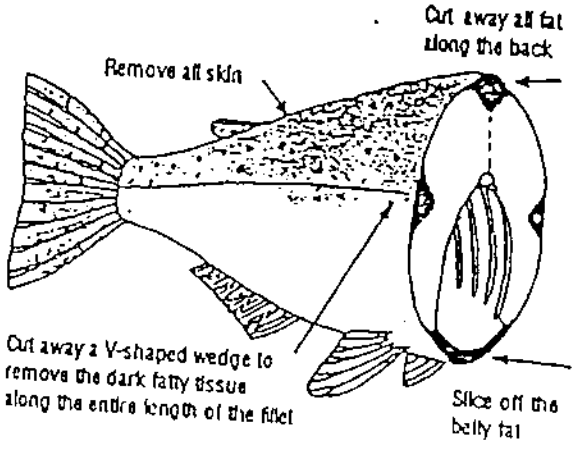


PCBs are a group of man-made organic chemicals with no known natural source. PCBs are oily liquids or solids and are colorless to light yellow. They have no taste or smell. PCBs have been shown to cause cancer in animal studies. Although PCBs are no longer made in the U.S., people can still be exposed to them from contaminated air, water, soil and food because they remain in the environment for a very long time.

A common way for PCBs to enter the body is by eating contaminated meat or fish that contain PCBs. Some PCBs can remain in the body for years. They are stored in the liver and body fat. High levels of PCBs can cause skin problems and abnormal liver function in some people. PCBs can be present in the breast milk of women. Studies have associated eating PCB-contaminated fish by women during and before pregnancy with adverse health effects in infants. However, there are uncertainties regarding these effects due to study limitations. For specific symptoms, though, your own physician should be consulted.

## How To Reduce PCB Contamination In Fish Prepared for Human Consumption

- Remove all organs and skin. Organs and skin can be high in fat and organic chemicals.
- Trim off the fatty areas shown in black on the drawing. This includes the belly fat, side fat and back fat. Organic contaminants concentrate in the fat.
- Bake or broil skinned, trimmed fish on a rack or grill so fat drips off. Throw away drippings.



M.J. "Mike" Foster, Jr.
GOVERNOR



- Keep smaller fish to eat. Usually, younger, smaller fish are less contaminated than larger, older fish.
- Vary diet by eating a variety of fish, shellfish, meat and poultry from different sources.

2/9/96
Eric T. Baumgartner
Assistant Secretary and State Health Officer
Department of Health and Hospitals

2/12/96
Bobby P. Jindal
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Department of Health and Hospitals

2/15/96 10-f 30
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2/21/96
J. Dale Givens
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)SPITALS

March 7, 1994

# FISH CONSUMPTION ADVISORY FOR WHAM BRAKE FROM THE RAILROAD BRIDGE ADJACENT TO THE HIGHWAY 134 OVERPASS DOWNSTREAM TO THE WEIR

## NO FISH TAKEN FROM WHAM BRAKE SHOULD BE EATEN.

The Louisiana Department of Health and Hospitals and the Louisiana Department of Environmental Quality are issuing the following **fish consumption advisory** for Wham Brake. Unacceptable levels of 2,3,7,8-tetrachloro dibenzo-p-dioxin (2378-TCDD), and 2,3,7,8-tetra chloro dibenzofuran (2378-TCDF) have been detected in samples of fish filets.

Dioxins are organic compounds that do not occur naturally in the environment but, rather, they are formed during certain manufacturing processes. Studies have shown that dioxin has the ability to cause cancers in laboratory animals exposed to high doses. Problems with reproduction and malformed offspring have also been noted in animal studies of the health effects of dioxin.

The scientific community is currently re-evaluating the effects of dioxin on humans. This health advisory is based on the best currently available information. It is important to emphasize that this advisory is issued to protect public health. Eating fish contaminated with dioxin for long periods of time could result in adverse health effects. This fish advisory takes into account high-risk individuals such as pregnant and breastfeeding women and children.

For more information contact the Section of Environmental Epidemiology, Office of Public Health, at 504-568-8537 or the Office of Water Resources, Louisiana Department of Environmental Quality, at 504-765-0634.

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Dale Givens,
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## FISH CONSUMPTION ADVISORY FOR BAYOU LAFOURCHE

The Louisiana Department of Health and Hospitals, Louisiana Department of Environmental Quality, and Louisiana Department of Wildlife and Fisheries are issuing the following fish consumption advisory for fish contaminated with dioxin in Bayou Lafourche (from the Highway 80 overpass downstream to interstate Highway 20 east of Monroe). This advisory supersedes the previous, more restrictive, fish consumption advisory for this water body.

Unacceptable levels of 2,3,7,8 tetrachloro dibenzo-p-dioxin (2,3,7,8-TCDD), and 2,3,7,8-tetrachloro dibenzofuran (2,3,7,8-TCDF) had been detected in samples of fish filets, especially in crappie (sac-a-lait). However, recent information has revealed that dioxin levels have decreased in all species, particularly crappie. Therefore, the "eat no crappie" recommendation made March 1994 is downgraded to the recommendation that crappie consumption be limited to two meals per month. The March 1994 recommendation to limit consumption of all other species to two meals a month remains in effect at this time.

To further reduce the risk of exposure to chemical contaminants possibly contained in other fish, consumers should trim the fat and skin from fish prior to cooking. Bake, broil, or grill the fish and then drain the fat. Vary your diet by eating a variety of fish, seafood, meat and poultry from different sources.

Dioxins are organic compounds that do not occur naturally in the environment but, rather, they are formed during certain manufacturing processes. Studies have shown dioxin can cause cancers in laboratory animals exposed to high doses. Problems with reproduction and malformed offspring have also been noted in animal studies of the health effects of dioxins.

The scientific community is currently re-evaluating the effects of dioxin on humans. This advisory is based on the best currently available information. It is important to emphasize that this advisory

is issued as a precaution. If you have eaten fish from this area of Bayou Lafourche, there is no immediate need to be concerned about your health. However, present and future eating habits should follow the guidelines in this advisory. This fish advisory takes into account high-risk individuals such as pregnant and breast-feeding women and children.

For more information, contact the Section of Environmental Epidemiology, Office of Public Health, at (504) 568-8537 or the Office of Water Resources, Louisiana Department of Environmental Quality, at (504) 765-0634.

Louis Trachtman, M.D. 12/16/96

Louis Trachtman, M.D., M.P.H. Date
Assistant State Health Officer
Department of Health and Hospitals

John LaCour for 1-7-97

Bobby P. Jindal Date
Secretary
Department of Health and Hospitals

1-8-97

James H. Jenkins, Jr. Date
Secretary
Department of Wildlife and Fisheries

1-10-97

J. Dale Givens Date
Secretary
Department of Environmental Quality

LOUISIANA DEPARTMENT OF HEALTH AND HOSPITAL
OFFICE OF PUBLIC HEALTH

# FISH CONSUMPTION ADVISORY FOR OUACHITA RIVER

DATE: July 29, 1992

The Louisiana Department of Health and Hospitals and Louisiana Department of Environmental Quality are issuing the following fish consumption advisory.

Unacceptable levels of mercury have been detected in samples of fish taken from the Ouachita River between the Louisiana/Arkansas border and the lock and dam at Columbia, La.; therefore, we advise that the following precautions be taken when eating fish from the Ouachita River:

FOR PREGNANT WOMEN AND CHILDREN (LESS THAN 7 YEARS OF AGE):
-Consume no bass, and limit consumption of other species of fish to 2 meals per month (a meal is considered to be half a pound of fish for an adult).

FOR NON-PREGNANT WOMEN, MEN AND CHILDREN (7 YEARS OF AGE AND OLDER): -Limit the consumption of bass to 2 meals per month.
There is no limit on other species of fish.

Mercury is an element that occurs naturally or as a result of chemical contamination. Low levels of mercury are found in soils, oceans, lakes and rivers, and fish. Since it is an element present in nature, people are exposed throughout their lives to low levels of mercury.

The amounts of mercury found in these fish are well below those that would make you sick. This advisory is issued as a precaution because levels are higher than expected. Further sampling will be accomplished to determine if this advisory is to be continued. If you have consumed fish, even bass from these waters, there is no immediate need to be concerned about your health. Pregnant women and children are more sensitive to mercury effects, therefore, this advisory has set lower limits for them. However, it is important to emphasize that the levels observed in these fish, do not present and immediate threat.

No precise source of contamination has yet been identified. Possible sources for these levels are deposition of mercury form air into the water, discharges form old mercury mines and natural dissolution of mercury from the soil. More fish samples will be collected, and the Advisory will be revised as necessary.

For more information contact the Water Quality Management Division, Department of Environmental Quality, at 504-765-0634 or Environmental Epidemiology Section, Office of Public Health, at 504-568-8537.

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# FISH CONSUMPTION ADVISORY FOR HENDERSON LAKE

Based on fish sampling in St. Martin Parish, unacceptable levels of mercury have been detected in largemouth bass, crappie (sac-a-lait), and freshwater drum taken from the Henderson Lake area. This area includes Henderson Lake, Lake Bigeux, and all waters within the area bounded on the north by the St. Landry-St. Martin Parish Line, on the east by the West Atchafalaya River levee (or Hwy. 3177), on the south by Hwy. 3177 and on the west by West Atchafalaya Basin levee. Therefore, the Louisiana Departments of Health & Hospitals, Environmental Quality, and Wildlife & Fisheries advise that the following precautions be taken when eating these species of fish from Henderson Lake.

- Pregnant women, breastfeeding women and children less than 7 years of age should limit consumption of largemouth bass, crappie (sac-a-lait) and freshwater drum to ONE MEAL PER MONTH. (A meal is considered to be half a pound of fish for adults and children.) There is no consumption limit on other species of fish.

AND

- There is no consumption limit on any species of fish for non-pregnant women, men and children 7 years of age or older. Currently detected mercury levels are below the advisory level for these groups of people.

Mercury is an element that occurs naturally in the environment. It is released into the atmosphere through natural processes and human activities. Consequently, there are small amounts of mercury in lakes, rivers and oceans. Nearly all fish contain trace amounts of mercury. They absorb mercury from the water and sediment as they feed on aquatic organisms. Larger predator fish contain more mercury than smaller fish. Therefore, it is recommended that smaller fish be consumed instead of larger ones.

M.J. "Mike" Foster, Jr.
GOVERNOR



People are exposed throughout their lives to low levels of mercury. One way they can be exposed to mercury is from eating contaminated fish. Health effects from harmful levels of mercury can include nervous system and kidney damage. Developing fetuses are more sensitive to the toxic effects of mercury, especially in the first trimester. In addition to developing fetuses, pregnant women, infants and children are more sensitive to the effects of mercury, therefore, consumption advisories are issued at lower tissue concentration levels for these groups.

This advisory is issued as a precaution. Further sampling will be carried out to determine if this advisory is to be continued or modified. If you have consumed fish, even largemouth bass, crappie (sac-a-lait) or freshwater drum from these waters, it is not likely that there is an immediate need to be concerned about the effect of mercury. For specific symptoms, though, your own physician should be consulted.

2/9/96
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2/15/96 1014 30
James H. Jenkins, Jr.
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2/21/96
J. Dale Givens
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Department of Environmental Quality

# NEWS RELEASE

DEPARTMENT OF ENVIRONMENTAL QUALITY
P. O. Box 44066, Baton Rouge, LA 70804

RECEIVED
87 NOV 24 P 1:06

Secretary

OFFICE OF WATER RESOURCES

DATE: NOVEMBER 24, 1987
FOR IMMEDIATE RELEASE

DEQ POSTS BAYOU BONFOUCA

FOR MORE INFORMATION CONTACT: BOB HANNAH (504) 342-6363

In a joint action the Louisiana Department of Environmental Quality and Department of Health and Human Resources have posted Bayou Bonfouca in St. Tammany Parish from 1/4 mile upstream of the Old American Creosote site to one mile south of Louisiana Highway 443. DEQ and DHHR advise the public not to swim in the bayou or eat fish taken from it. This action has been taken based upon the designation of this area of Bayou Bonfouca, and an adjacent land site formerly occupied by American Creosote Company, as a United States Environmental Protection Agency National Priorities List Superfund site.

Available data do not indicate contamination in seafood to be a significant health threat. However, this precautionary action is taken in case pollutants from the site are mobilized while clean up operations are underway. The greatest likelihood of exposure to humans through swimming or eating seafood since the American Creosote fire and creosote release in 1972 will occur during clean up operations.

Final remediation plans are still under review by Superfund officials, and no date for initiation of clean up has been set. The duration of this advisory will extend through the completion of the clean up and until the state analyzes fish and water samples. When they are deemed safe, Bayou Bonfouca will be reopened to swimming and fishing.

-30-

LOUISIANA DEPARTMENT OF HEALTH AND HOSPITALS
OFFICE OF PUBLIC HEALTH

# INFORMATIONAL HEALTH ADVISORY FOR THE CALCASIEU ESTUARY

DATE: April 7, 1992

The Louisiana Department of Health and Hospitals and the Louisiana Department of Environmental Quality are issuing the following health advisory for the Calcasieu Estuary from the salt water barrier to the Gulf of Mexico.

Traces of chemical contamination (Hexachlorobenzene HCB and Hexachlorobutadiene HCBD and Polychlorobiphenyls PCB) have been found in some samples of fish and seafood from the Calcasieu Estuary. This advisory modifies previous advisories in response to additional scientific information. The levels of contamination (except for Bayou d'Inde) are too low to cause a consumption advisory under the present guidelines used by the Louisiana Department of Health and Hospitals and the Louisiana Department of Environmental Quality. Persons that catch and eat most of their fish from these waters should know about the presence of chemical contamination so that they can make an informed decisions as to the quantity of fish they want to eat from this area. Recommendations made in this advisory have taken into account individuals with special sensitivities, pregnant women and children.

Traces of industrial or agricultural chemicals as well as some natural chemicals are frequently present in fish, seafood, meat and poultry. High consumption of food contaminated with these chemical residues over a long time may increase the risk of cancer or other diseases. The chemicals are usually more concentrated in the fat. Such chemical contaminants are undesirable and should be eliminated.

To cut down the exposure to these chemical contaminants, you should trim the fat from fish, seafood, meat and poultry prior to cooking; bake, broil or grill, then drain the fat; vary your diet by eating a variety of fishes, seafood, meat and poultry from different sources.

For more information, contact the Water Pollution Control Division, Department of Environmental Quality, at 504-765-0634 or the Environmental Epidemiology Section, Office of Public Health, at 504-568-8537.

NEWS RELEASE

LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
P.O. BOX 44066
BATON ROUGE, LOUISIANA

FOR IMMEDIATE RELEASE

DATE: January 17, 1989

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DEQ ADVISES THE PUBLIC CONCERNING CHEMICAL CONTAMINATION IN WATER BOTTOM SEDIMENTS IN OLSEN BAYOU NEAR CARLYSS IN CALCASIEU PARISH

The Louisiana Department of Environmental Quality (DEQ) has announced that a portion of Olsen Bayou in Calcasieu Parish southwest of Lake Charles is being posted with signs warning the public of chemical contamination in bottom sediments (soil) in the bayou. The portion of Olsen Bayou that is being posted with the signs covers approximately one half mile, starting at the northern boundary of the Carlyss Pit #1 abandoned hazardous waste site and extending downstream to a point approximately one quarter mile upstream from Moss Lake.

The purpose of this action is to inform the residents of the area and the general public of the existence of what is considered by DEQ to be significant chemical contamination in the bayou sediments. The chemicals of concern include 1,2-dichloroethane (also known as EDC), 1,1,2-trichloroethane, and trichloromethane (also known as chloroform). DEQ has reviewed data which indicate that contamination exists in localized areas in the bayou. Some sites show nondetectable levels of chemical contamination while other sites reveal chemicals occurring in the bottom sediments (soil) at levels ranging from several parts per billion to as high as four hundred parts per million.



The source of the chlorinated organic chemicals contaminating sediments is the adjacent Carlyss Pit #1. This hazardous waste s now undergoing remediation/cleanup evaluation by DEQ, was the rec various industrial hazardous wastes that contained these chemical Carlyss Pit #1 site was actively receiving these wastes during the October 1968 to September 1972, after which date the site was clos The site has not received additional wastes since that time. The contamination into the adjacent bayou sediments is presumed to hav overflows, unauthorized discharges and possibly subsurface migrati chemicals from the pits on the site.

The levels of chemical contaminants in the Olsen Bayou sedime been judged by DEQ as being substantially elevated over "backgroun upon comparison with chemical data for a number of sediment sample throughout the Calcasieu estuary and in the near vicinity of the C #1 site.

The Department of Environmental Quality has requested the ass other state agencies, including the Department of Health and Hospi Department of Wildlife and Fisheries, in order to acquire addition the Calcasieu estuary. The Department of Environmental Quality and involved state agencies will keep the public advised concerning de in this situation.

STATE OF LOUISIANA
DEPARTMENT OF HEALTH AND HOSPITALS

...n W. Edwards
GOVERNOR

Department ...
HEALTH ...
HOSPITAL...

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~~February 19, 1999~~

FOR IMMEDIATE RELEASE
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TOPIC: TENSAS RIVER ADVISORY

Traces of chemical contamination (DDT, Toxaphene) found in some samples of fish from the Tensas River from Highway 581 to Bayou Macon do not pose a health risk, officials said today.

83 miles

An advisory issued by the Department of Health and Hospitals' (DHH) Office of Public Health (OPH), the Department of Environmental Quality (DEQ) and the Department of Agriculture & Forestry noted that more extensive analysis is being performed by OPH and DEQ laboratories to measure accurately the amount of contamination.

The advisory takes into account individuals with special sensitivities, pregnant women and children, and states "persons that catch and eat most of their fish from these waters should know about the presence of chemical contamination so that they can make their own decisions as to the quantity of fish they want to eat from this area.

"Traces of industrial or agricultural chemicals, as well as some natural chemicals are frequently present in food. High consumption of food contaminated with these chemical residues over a long period of time may increase the risk of cancer."

The advisory notes that chemicals are usually more concentrated in the fat and continues, "such chemical contaminants are undesirable and should be eliminated but in most cases they do not represent any present health hazard."

-more-

ADD ONE

TOPIC: TENSAS RIVER ADVISORY

The advisory recommends that fat be trimmed from food prior to cooking and that it be baked, broiled or grilled. The advisory further urges that diets be varied by eating a variety of food from different sources.

DDT and Toxaphene were removed from the market a number of years ago and are no longer used in agriculture.

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